

Network of Excellence on Communication by Gaze Interaction

Main Goals



- Improve the quality of life of people with motor-control difficulties
- Develop effective methods of communication by eye gaze
- Develop assistive technology that is empowering and fun to use



General Goals



- Integrate cutting-edge expertise
 - Join the forces of researchers, enterprises and user organisations
 - Develop eye tracking technology and applications
- Lead the way to mainstream applications
 - Overcome the obstacles for wide-spread use of eye tracking
 - Bring down cost
 - Develop standards for plug-and-play eye tracking
 - Improve usability of eye tracking systems
- Disseminate information

Activities

- Integrating activities
 - Durable community building (WP1)
 - Standardisation (WP2)
 - User involvement, Analysis and Evaluation (WP3)
- Joint research programme
 - Tool development (WP4)
 - Eye tracker development (WP5)
- Spreading of excellence activities
 - Community outreach (WP7)
 - Academic impact (WP8)
- Management (WP9)



Durable Community Building



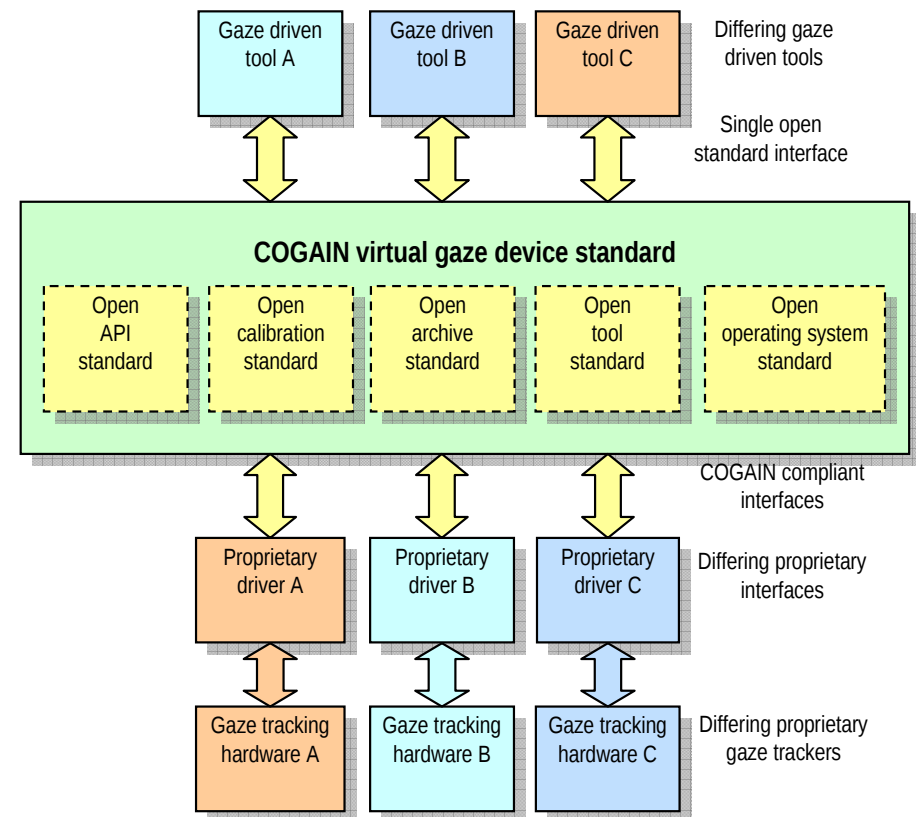
- Web portal at www.cogain.org
 - Sharing information and results
<http://www.cogain.org/results>
 - Internal working areas for management and task forces
 - Discussion forums
 - Various mailing lists
- COGAIN camps
- COGAIN conferences



Standardisation



- Survey of de-facto standards in eye tracking
- Requirements for the common format of eye movement data
- Standards for gaze based environmental control



User Involvement

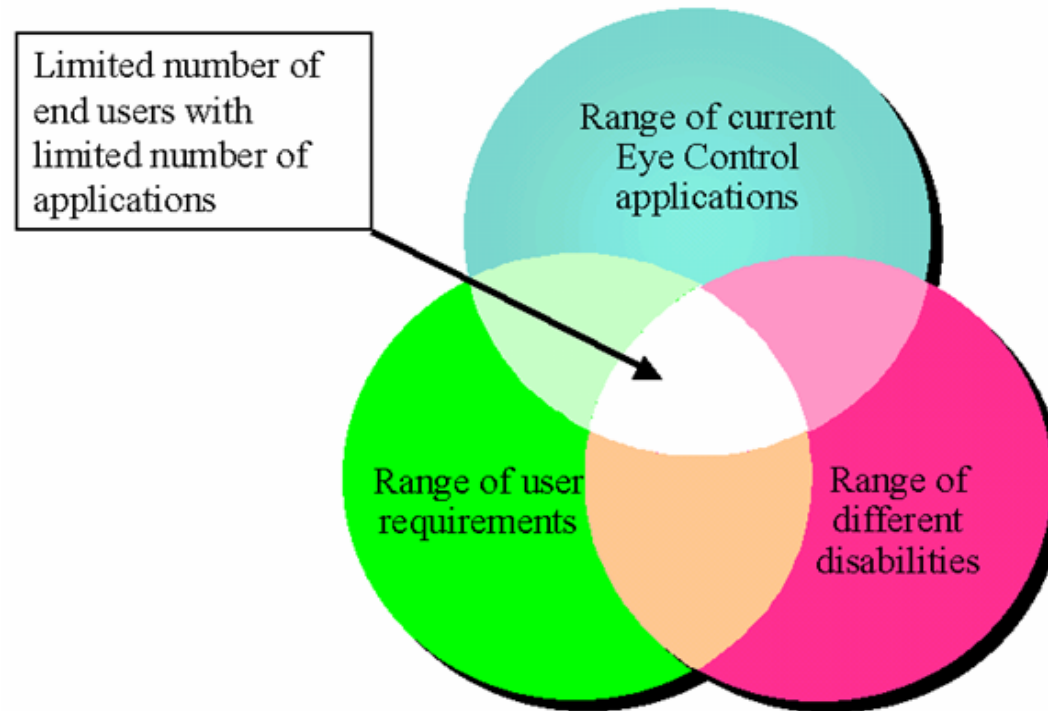
- Questionnaires on user needs
- User trials and training
- Usability studies
- Research retreats
- COGAIN Camps

User Requirements report



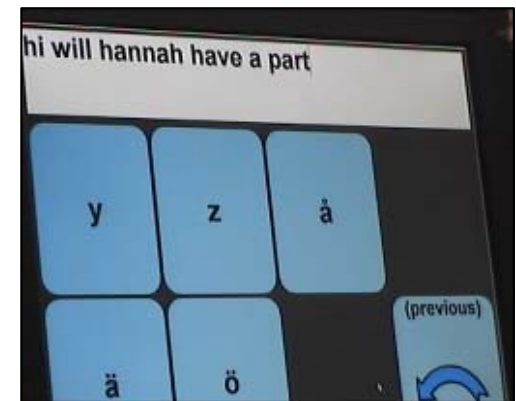
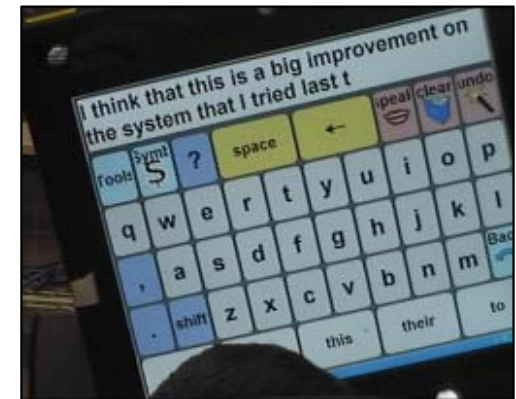
User Requirements Report

- Current situation: Only a limited range of user requirements are met for a limited number of people who might greatly benefit from eye control



User Requirements Report

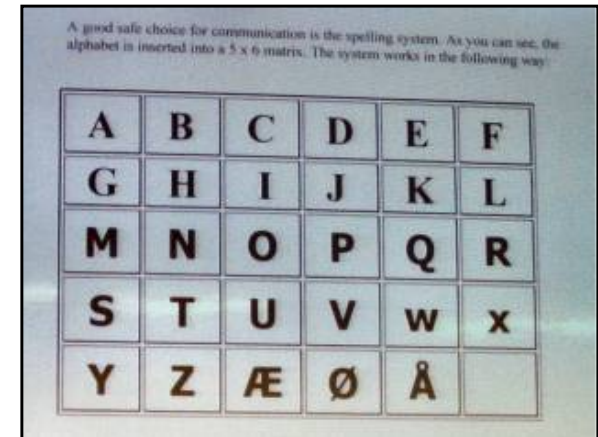
- Recommendations for both eye control hardware and software, e.g.
 - Calibration issues
 - Resizable cells and grids
 - Choice of output styles
 - Speech facilities
 - Choice of languages
 - Choice of symbols or text output
 - Safety issues (e.g. infrared exposure)
 - Positioning and mounting



Camp Highlight:

Excerpts from the talk by Arne Lykke Larsen

- *I was diagnosed with ALS four and a half years ago at the age of 35*
- *Today, my whole body is essentially paralyzed*
- *The advantage of the spelling system is that it always works. [upper picture on right]*
- *Personally I use the spelling system mainly for small-talk, and to give direct orders to my personal assistants*
- *On the other hand, if you want to do poetry or philosophy or theoretical physics, then the spelling system is not really adequate*
- *For any serious writing, I use an eye tracker*



...and more user requirements



- Possibility to adjust various parameters to meet individual needs and abilities
- Easy and independent calibration and recalibration
- Ability to move without the need for recalibration
- Ability to switch between different kinds of input and output modalities (multi-modal)
- Possibility to access any Windows application (internet, email, games, etc.)
- Eye control system's tolerance to varying conditions (e.g. sunshine)
- Portability, ability to attach to a wheelchair
- Flexibility and accommodation of a wide range of individual differences and needs
- Possible to move independently from one application to the next

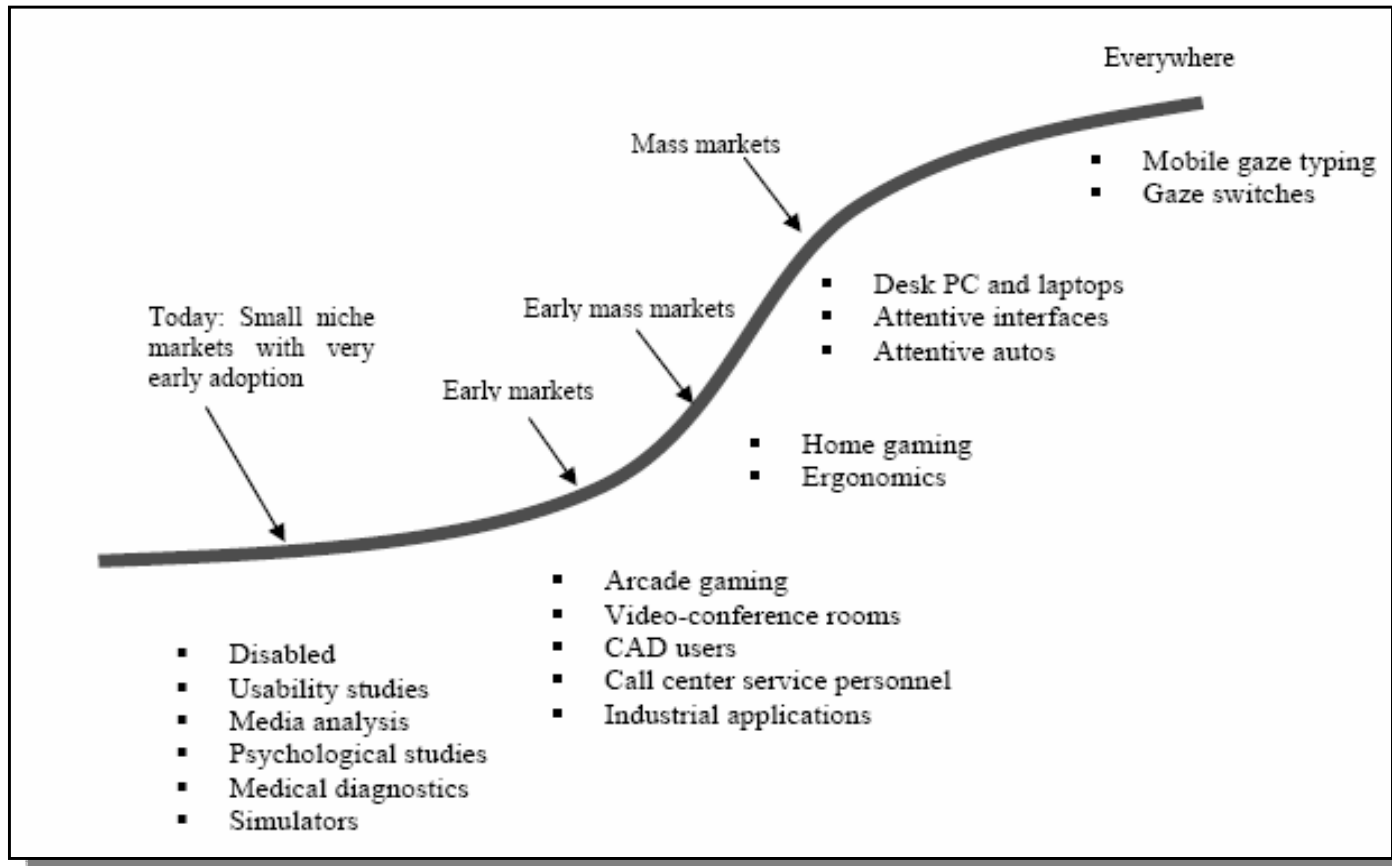


User Population



- Currently less than 2,000 users in Europe
- Potential market includes people with varying conditions, e.g.:
 - Motor Neurone Disease (MND) / Amyotrophic Lateral Sclerosis (ALS)
 - Multiple Scleroses (MS)
 - Cerebral palsy (CP)
 - Spinal Muscular Atrophy (SMA)
 - Werdnig-Hoffman Syndrome
 - Rett Syndrome
 - Muscular Dystrophy (MD)
 - Locked-in Syndrome
 - Quadriplegia – Spinal Cord Injury (SCI)
 - Brainstem Stroke
 - Traumatic Brain Injury (TBI)
 - Repetitive Strain Injury (RSI)

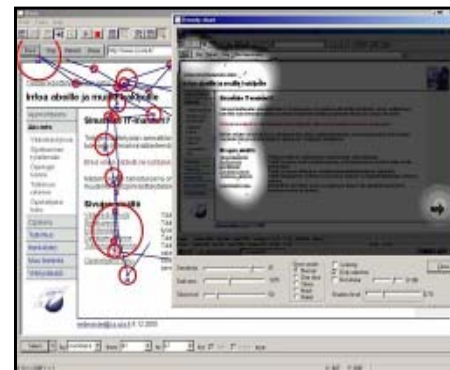
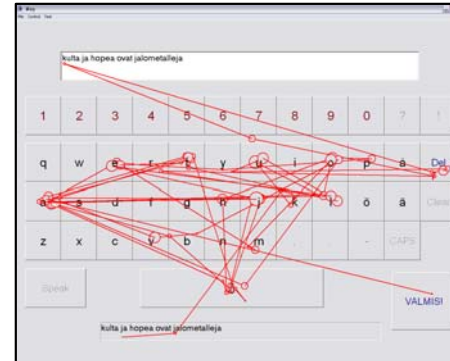
Possible development of the gaze tracking market



(Hansen et al. 2005)

Analysis and Evaluation

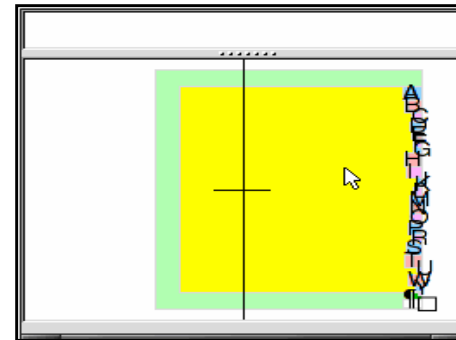
- Analysis tools for eye movement data
- State of the art report of evaluation methodology
 - *What* and *how* to measure
 - Potential evaluation metrics and methods, with special consideration on conducting user trials with people with disabilities



Application Development



- Application development
- Design specifications and guidelines for COGAIN eye typing systems
- Research retreat on gaze writing
- Prototypes available on web (www.cogain.org/results/applications)

A screenshot of a web application interface. It shows a text input field with the text "We present a communication 232". To the right of the input field, there is a table with two columns: "Raw--XEmacs: UKO Text" and "UKO Matches". The table contains several rows of text, including "per did air act red tea fit aid tip ted pet pit", "b j k n o a d f p q c e g h i", "s u v w x r t ' - l m y z", and "Command". Below the table, there are four buttons labeled "Button 1", "Button 2", "Button 3", and "Button 0".

Raw--XEmacs: UKO Text	UKO Matches
per did air act red tea fit aid tip ted pet pit	
b j k n o a d f p q c e g h i	
s u v w x r t ' - l m y z	
Command	

A screenshot of a web application interface. It shows a grid of buttons. The top row has two buttons: "ABCD..." and "Edit". The bottom row has four buttons: "Delete Character", "w", "t", and "a". The middle row has four buttons: "the", "o", "s", and "i".

	ABCD...	Edit	
Delete Character	w	t	a
the	o	s	i

Eye Tracker Development

- Eye Tracker Development
- Research retreats on eye tracker development
- Eye tracker catalogue available on web (www.cogain.org/eyetrackers)



Community Outreach



- Demos at exhibitions
- Project presentations
- Press releases
- Media appearances
- Videos
- Brochure
- Poster
- Private visits
- Research retreat
- COGAIN camps



Academic impact

- Tutorials and PhD schools
- Camp training
- Special sessions and workshops
- Scientific conferences
- Educational programme
- Supporting joint publications

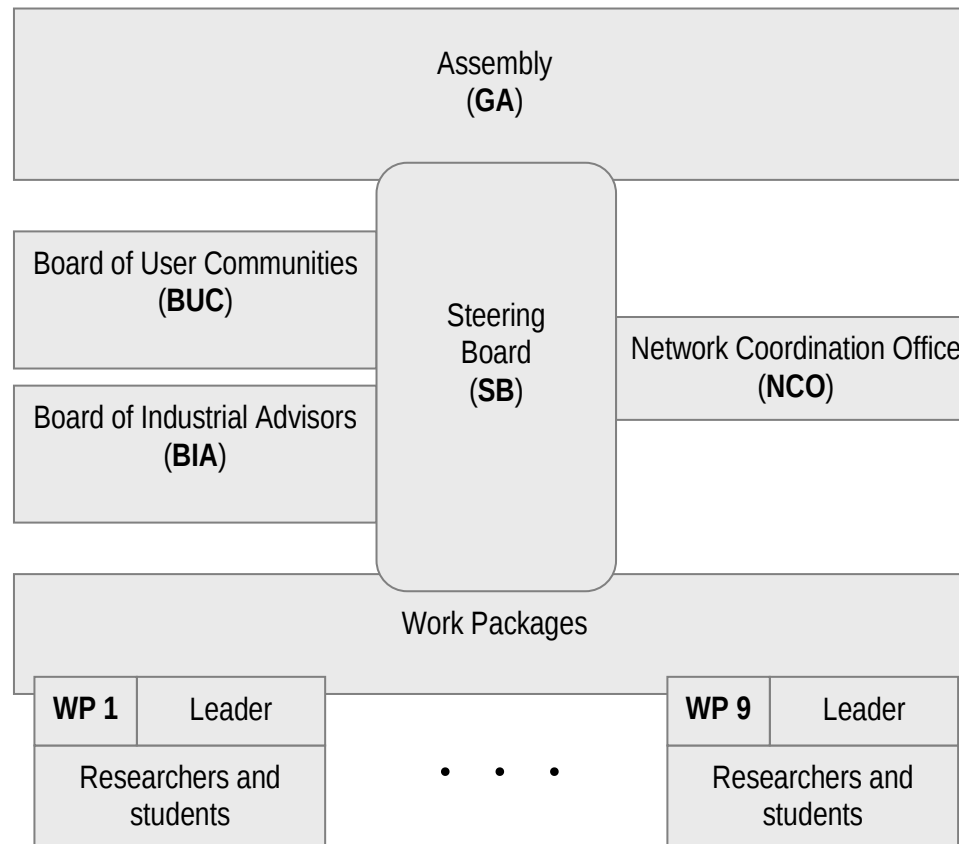


Management



- Assembly
 - Includes a representative of each partner in the network
 - Is chaired by the consortium coordinator
 - Makes the main policy decisions such as approving updates to the JPA, approving new partners and selecting the changing members of the Steering Group
- Steering Board (10 members)
 - The main managerial and administrative entity of the whole network
 - Has as permanent members representatives from the coordinator, the vice coordinator and all other Work Package leaders
 - In charge of the scientific quality of the endeavours of the network
 - Meetings 3-4 times per year
- Network Coordination Office
 - Overall day-to-day management, monitoring, reporting, financial management
 - Prepares and organises the meetings of the Steering Board

Management Structure



Partners



Finland

- University of Tampere

Denmark

- IT University of Copenhagen
- Bispebjerg Hospital
- Danish Centre for Assistive Technology
- Risø National Laboratory
- Danmarks Tekniske Universitet

Germany

- Technische Universität Dresden
- Universität Koblenz-Landau
- Universität zu Lübeck

Italy

- Hewlett Packard Italiana SRL
- Politecnico di Torino

Lithuania

- Siauliai Universitetas

Japan

- Tokyo Institute of Technology

United Kingdom

- ACE Centre Advisory Trust Ltd
- University of Cambridge
- De Montfort University
- Loughborough University

Sweden

- Sahlgrenska University Hospital (DART)
- Tobii Technology

Switzerland

- Universität Zürich

Spain

- Universidad Publica de Navarra

Czech

- Czech Technical University

France

- Metrovision

USA

- LC Technologies
- EyeTech Digital Systems



Facts



- Launched in September 2004
- 5-year project
- 2.9 M€ from the EU's 6th Framework Programme under the Information Society Technologies (IST) priority
- COGAIN is a *Network of Excellence*
- Over 100 researchers from 13 countries



Are you interested?



For more information, visit
www.cogain.org



Thank you for your attention!

